


# RFID for Chicken


## Reseller

Company	Location	SDK	Chip Series	Remarks
FONKAN	Shenzhen	SDK not publically downloadable		
INVELION	Shenzhen	SDK downloadable		
CHAFON	Shenzehn	SDK downloadable		pw: chafonsdk
Chicken Wing Tags Plastic		Made-in-China		
Marc RFID Store		Aliexpress		
Chip	Product Link			Company
E710	<a href="#">Impinj E710 Reader Chip Product Brief</a>			impinj
Ennn Series	<a href="#">Impinj E910, E710, E510, and E310 RAIN RFID Reader Chip Datasheet v4</a>			impinj

- Press Release on Ennn SDK:  
<https://www.impinj.com/library/blog/speed-up-device-development-with-impinj-e-family-firmware-and-sdk-v20>

## Chafon Products

Purchased	Product	Chip	Company	Speed	Price	Datasheets
	<a href="#">CF811 Even UHF eight-channel Fixed Reader</a>		Chafon	200 tags per sec	USD180	<a href="#">cf811_en.pdf</a>
	<a href="#">CF815 Even E710 UHF four-channel Fixed Reader</a>	E710	Chafon	800 tags per sec	USD195	<a href="#">cf815_en.pdf</a>
😊	<a href="#">CF816 Even E710 UHF eight-channel (mux) Fixed Reader</a>  16.4*13.5*2.6cm	E710	Chafon	800 tags per sec	USD240	<a href="#">cf816_en.pdf</a>
	<a href="#">CF800 OS UHF 8 ports fixed reader</a>		Chafon	800 tags per sec	USD380	<a href="#">cf800_en.pdf</a>

Purchased	Product	Chip	Company	Speed	Price	Datasheets
	<a href="#">CF-RA8080 UHF RFID ceramic antenna</a>		Chafon	3-4m read range	USD20	<a href="#">cf-ra8080_en.pdf</a>
😊	<a href="#">CF-RA5005 UHF 5dBi Counter Antenna</a>  PCB size: 12*12cm Antenna coax cable: 3 meters		Chafon		USD27.5	<a href="#">cf-ra5005_cn.pdf</a>
	<a href="#">CF-RA6005 UHF Narrow Angle Beam Antenna</a>		Chafon			<a href="#">cf-ra6005_cn.pdf</a>
😊	<a href="#">CF661 Prime UHF 6dbi integrated reader</a>		Chafon	200 tags per sec	USD80	<a href="#">cf661_en.pdf</a>

## CF816 Multiplexing

- ~0.4s one cycle (Start from port1 to port8)

My suggestion is to buy **CF816** Fixed reader. **CF816** and **CF811** are basically the same, the main difference is that **CF816** is using impinj E710 chip, which is more sensitive in reading and has a higher reading speed. **CF816** also has more API commands than **CF811**.

**CF800** is also using impinj E710 chip and has Android operating system additionally, which I think is not necessary to us. The API of the **CF816** and **CF800** are the same.

And buying two to four **CF-RA8080** UHF RFID ceramic antennas to use with the Fixed reader, The gate size of the chicken house is around 30cm height and 27cm width. The ceramic has a size of 80\*80\*5mm, with circular polarization, its reading angle is 60 degrees forward. So it is possible to cover the gate size. But we can also go for a PCB antenna. For PCB antennas, I suggest **CF-RA5005** UHF 5dBi Counter Antenna, also with circular polarization (120\*120\*6.5mm).






Fig.1 CF-RA8080 (Left) CF-RA5005 (Right)

**CF-RA6005** UHF Narrow Angle Beam Antenna fits the gate width perfectly, but it is not waterproof.

And two **CF661** integrated readers, with a read range 0-6 meters. Prime reader and Fast reader are using the same SDK.

## Wing Tags

	Seller	Wing Tags	
1	<a href="#">Game and Poultry</a>	<a href="#">game_poultry_2022_flyer.pdf</a>	<a href="#">game_poultry_catalogue_2025_euro_direct_-_english.pdf</a>
2		<a href="#">Wonderband</a>	
3		<a href="#">CCC Tag</a>	
4		<a href="#">Offset CCT Tag</a>	
5	<a href="#">Marc RFID Store</a>		
6	<a href="#">water washing tags</a>		
7	<a href="#">RFID UHF foot ring tags</a>		
8	<a href="#">Made-in-China</a>		

9	Made-in-China Customization		
10	Caisley		
11	National Band & Tag Company	<p style="text-align: center;">893-3</p>  <p style="text-align: center;">Jiffy Style Wing Tags</p>	 <p><b>Video</b></p> <p>Wing Banding Directions - National Band &amp; Tag Company (<a href="#">YouTube</a>)</p>

### How to Mount Wing Tags to Little Chicks













**Video**

How to place Jiffy style wing bands on chicks - Darrel Millen ([YouTube](#))

### UHF RFID tags set of various size

860-960MHz ISO18000-6C UHF RFID tags samples 10pcs per kind *10kinds	
10PCS Sample Long Range 1-12M RFID UHF Tags Wet Inlay Adhesive Sticker EPC Gen2 6C 860-960Mhz For Asset Tracking Inventory	
Passive UHF RFID Anti Metal Sticker 18000-6c Ultra Thin RFID Metal Sticker Tag for Asset Tracking Management	
10PCS Long Range RFID UHF Tags Sticker Wet Inlay 860-960mhz Alien U7 EPC Global Gen2 ISO18000-6C	
860-960MHz ISO18000-6C UHF RFID anti metal tags RFID passive cards	
Hitachi UHF Ultra Small Package Tag (2.5mm x 2.5mm)	<a href="#">hitachi_pkg_tag.pdf</a>
Mini-UHF-RFID 8mm ø	

# Tags size/range comparison CF816

Tag Type	Tag Photo	size	range (CF816)	range (CF661)	conditions
1		7,08 * 1,6mm	0-3mm	~	few mm only at the edge of the antenna
2.1		12,28mm ø	 45cm	 37cm	Less curved surface
2.2		12,28mm ø	 14cm	 14cm	14cm for the more curved surface was measured in the condition that pointing the tag either to right or left. And the detection was very bad when pointing the tag upward or downward.
3		4 * 95,5mm	 ~180cm	 ~99cm	warpped to a surface area of 17mm * 9.22mm

## Mounting for antennas



25 cm diameter for the base  
44 cm height including base  
44-74 cm for the arm





Product	Seller	Material	Price	number of Arms	length can hold
<a href="#">OHLPRO Heavy Duty Drilling Base Tablet Holder</a>	Amazon	Plastic	€23.99	1-3	unclear
<a href="#">OHLPRO Tablet Holder Car Holder</a>	Amazon	ABS Plastic	€24.99	2-3	11.7cm-23.5cm
<a href="#">Mobile Phone Wall Mount</a>	Amazon	ABS plastic	€23.99	2	5.5cm-8.5cm
<a href="#">Czemo Gooseneck Tablet Holder</a>	Amazon	ABS plastic			
<a href="#">K&amp;M 232BK Table Microphone Stand</a>	Thomann		€25		
<a href="#">Roadworx Tablet Clamp</a>	Thomann		€10.50		
<a href="#">Roadworx Spacer 200</a>	Thomann		€7.50		
<a href="#">Roadworx Universal Ball Joint</a>	Thomann		€12.90		
<b>K&amp;M 25960</b>	<b>Thomann</b>		<b>€56</b>		

## Mini PC/ Router

	Product	Company	Datasheet	Quick start guide
Router	<a href="#">Teltonika RUT956</a>	Teltonika	<a href="#">717017-rut956-datasheet-2024-v11.pdf</a>	<a href="#">QSG RUT956</a>
Mini PC	<a href="#">NiPoGi AK1 Plus mini PC</a>	NIPOGI		

## RUT956 setup

## Adapterkabel USB auf Seriell RS232

[UT232R-500](#) | [ut232r-500.pdf](#)

## Location



<https://maps.app.goo.gl/hS5ABpBWNq8r5ujq9>

## Geometry

Dicke der Außenwand ca. 30 cm.

Abstand der Klappen

Stall 1

1 zu 2: 1,60 m

2 zu 3: 5 m

3 zu 4: 3,56 m

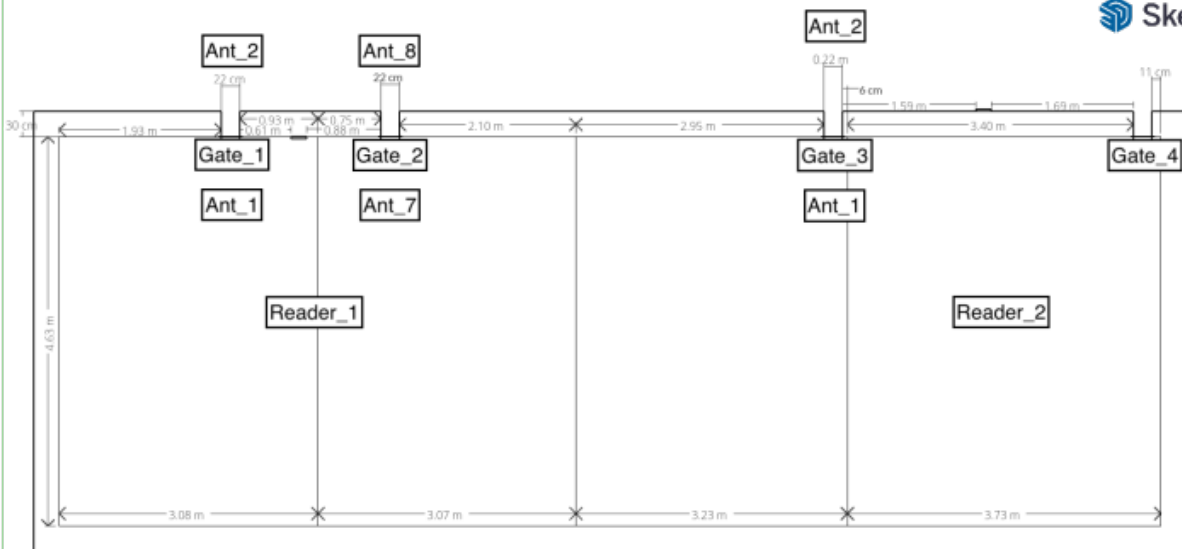
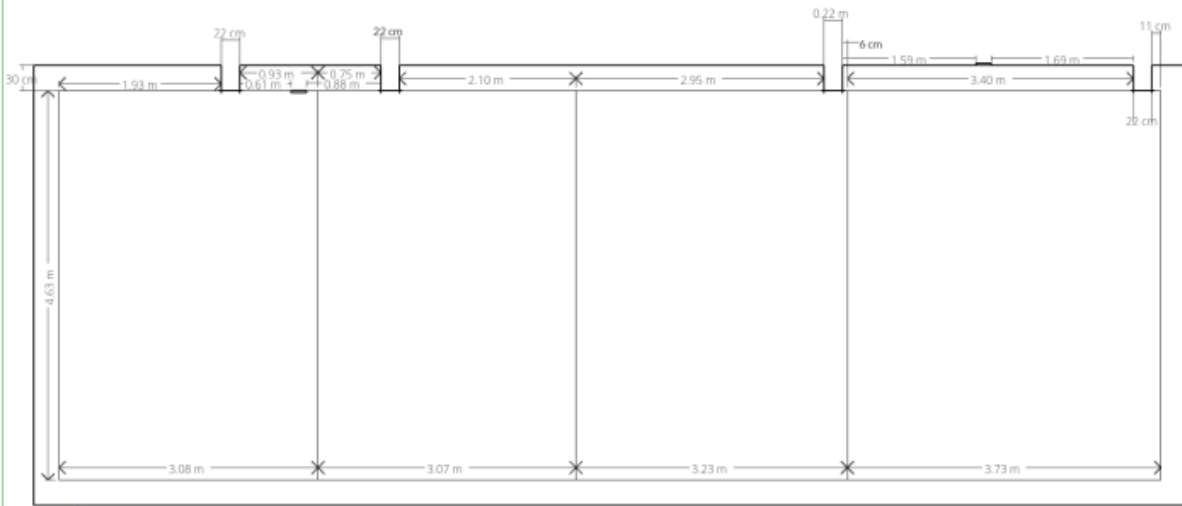
Stall 2

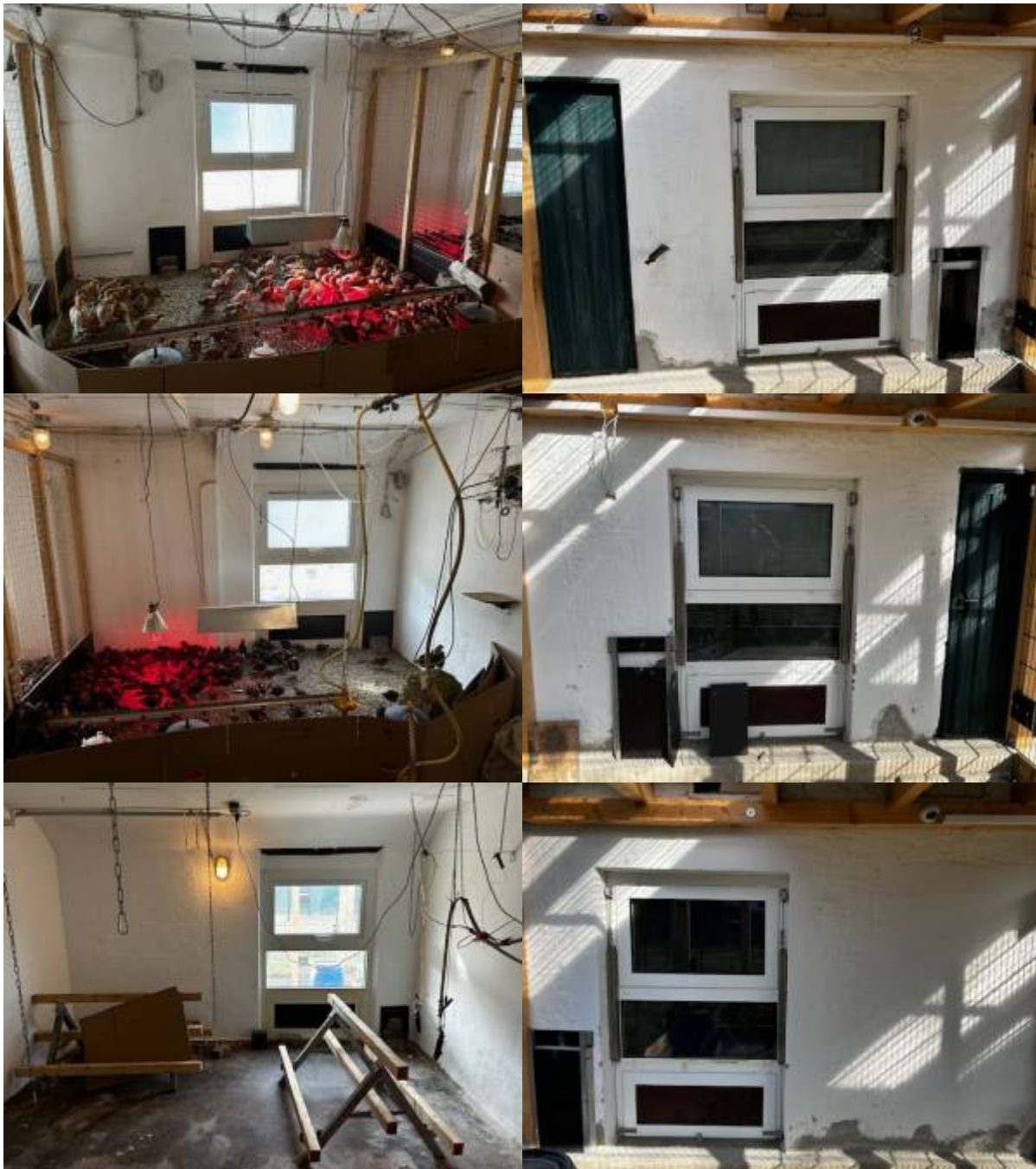
5 zu 6: 2,48 m

6 zu 7: 1,28 m

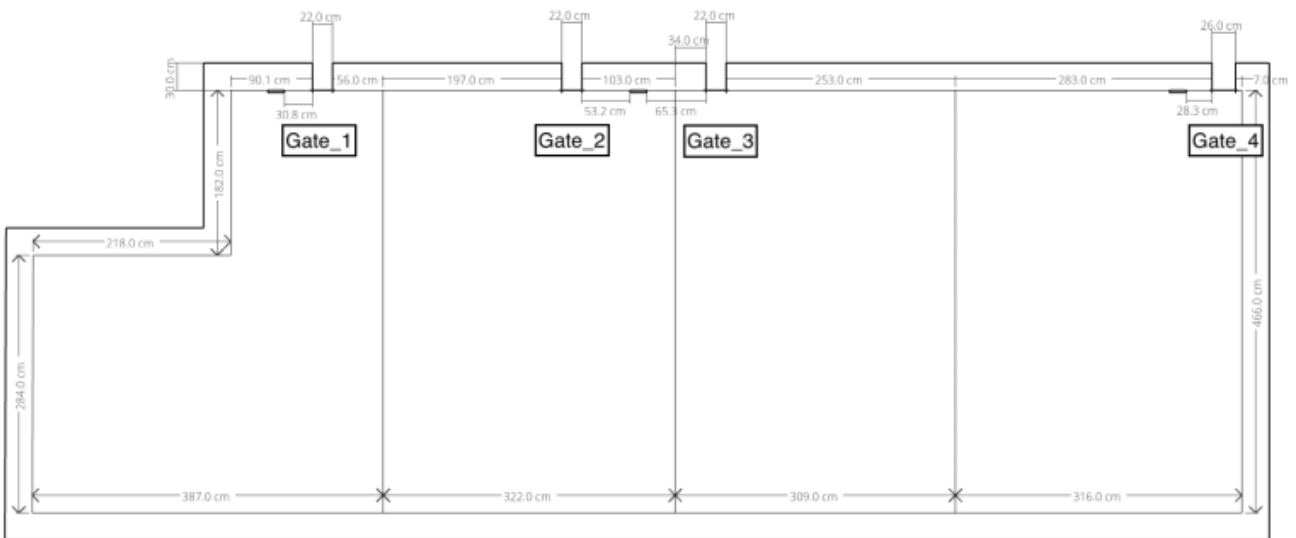
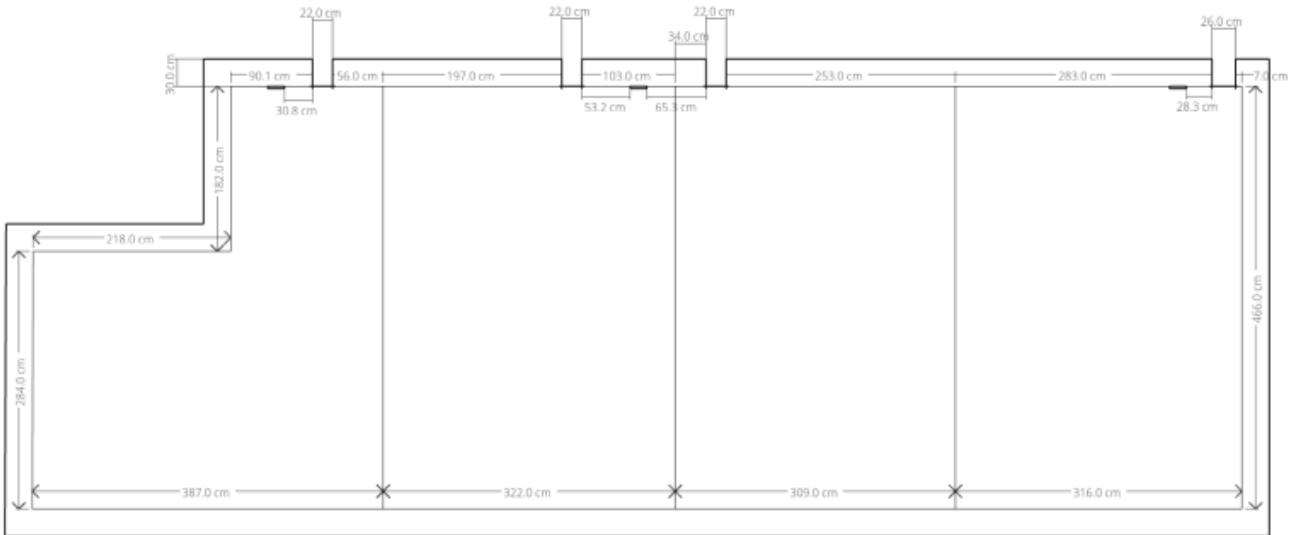
7 zu 8: 5,20 m

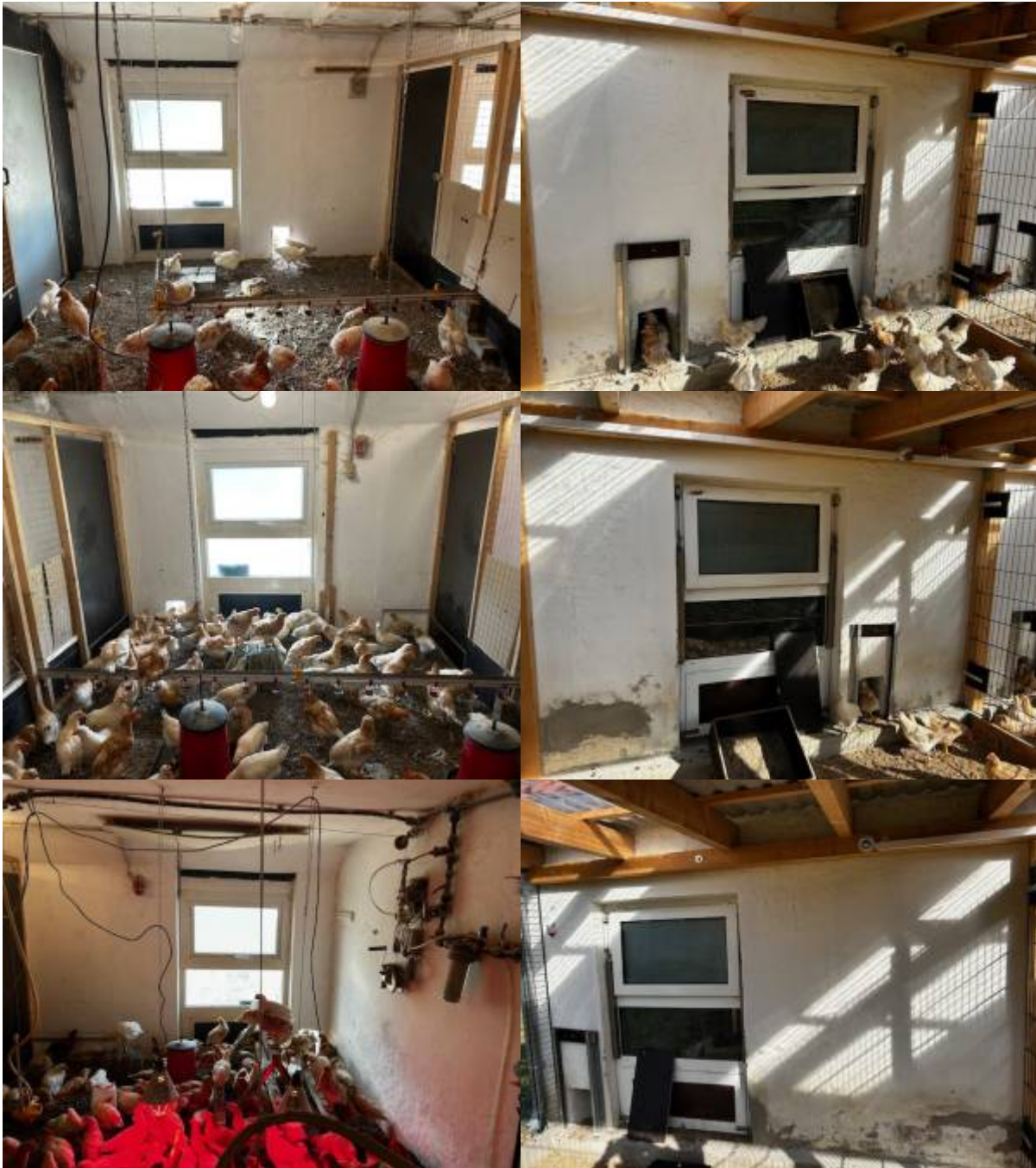
## Chicken coop 1





## Chicken coop 2





## Wall





### Kalisto Test



Tag is mounted from outer part of the wing to inner part as shown on the right. The rfid tag is faced

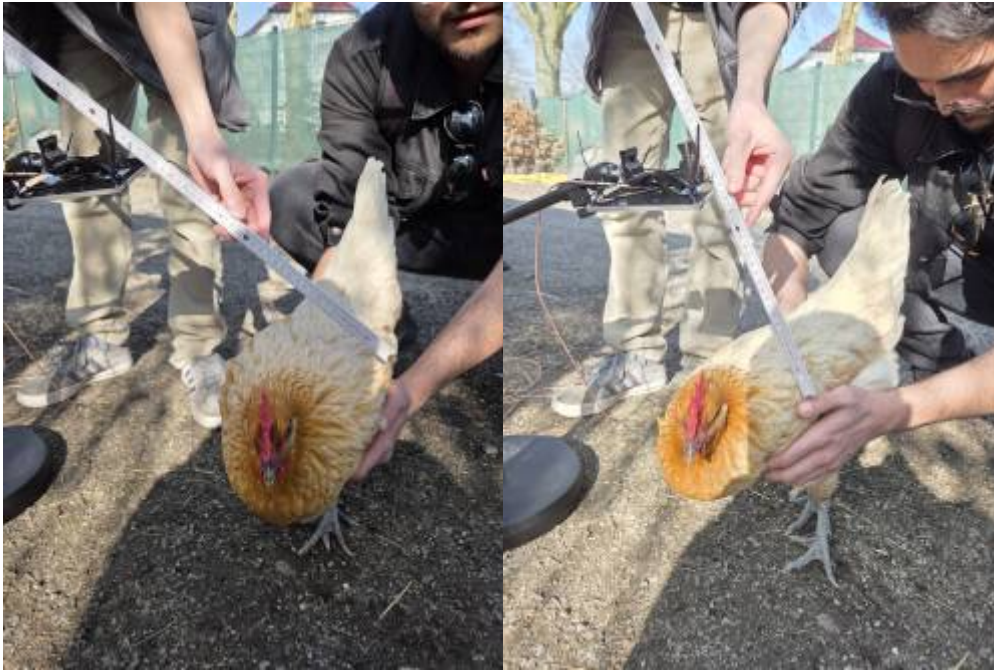
outside



Approximate of 24 cm height of the rfid tag from the ground



Antenna placed horizontally at 50 cm height on the ground able to read the rfid tag reliably. Antenna was then lifted up to at most 100 cm and still able to read the rfid tag (read range approximately 25-70cm).



33 cm read range from the side of the antenna



44 cm read range with antenna tested from tilted 35 to 45°

## Installation on 14.05.2025

### OpenVpn

PiVPN

RUT956 Config - VPN

```
sudo nano /etc/openvpn/ccd/Router956-Chicken  
--> iroute 192.168.1.0 255.255.255.0
```

```
sudo nano /etc/openvpn/server.conf  
--> route 192.168.1.0 255.255.255.0  
--> push "route 192.168.1.0 255.255.255.0"
```

```
sudo systemctl restart openvpn
```

## systemd

```
sudo nano /etc/systemd/system/reader1.service
```

```
[Unit]
Description=RFID Reader 1
After=network-online.target
Wants=network-online.target

[Service]
Type=simple
User=chicken_2
WorkingDirectory=/home/chicken_2/Documents/Reader_online
ExecStart=/home/chicken_2/Documents/Reader_online/chicken/bin/python \
  /home/chicken_2/Documents/Reader_online/reader1.py \
  --port /dev/ttyUSB0 \
  --power 30 \
  --antennas 1,2,7,8 \
  --interval 0.1
Restart=always
RestartSec=5
StandardOutput=append:/home/chicken_2/Documents/Reader_online/reader1_stdout
.log
StandardError=append:/home/chicken_2/Documents/Reader_online/reader1_stderr.
log

[Install]
WantedBy=default.target
```

```
sudo systemctl daemon-reexec
sudo systemctl daemon-reload
sudo systemctl enable myscript.service
sudo systemctl start myscript.service
```

## Stop systemctl

```
sudo systemctl stop reader1.service
```

## More informations about wing band/tags

- [Kevin J.McGowan's Crow study](#)
- [Jane Robinson \(2022\): RFID in Turkey Breeding: A better path to progress](#)
- [GPS Pigeon Tracking Ring](#)
- [Friends of Red Kites in the North East of England](#)
- [Phil Littler and John Middleton \(2014\): Marsh Harriers strike out across Europe](#)
- [Rogier Poultry Supplies: Leg Bands, Wing Bands, and Zip Ties](#)

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Last update: **2025/06/23 14:54**

